1981 VA: A NEW APOLLO ASTEROID. E.F. Helin, R.S. Dunbar and J.G. Williams, Jet Propulsion Laboratory, Pasadena, CA 91109

Apollo asteroid 1981 VA was discovered by E.F. Helin on a photographic plate taken on November 4, 1981 U.T. with the 1.2 m Schmidt at Palomar Observatory. This is the first Apollo found since December 1979. It was discovered during a limited survey for high inclination asteroids being conducted by Helin and Dunbar.

When initially observed, 1981 VA displayed daily motion of 2.2° per day and an apparent magnitude of 16.5. It has an absolute magnitude of 18. It was discovered at an unusually high declination of 56 degrees, moving rapidly to the southwest. About two dozen observations have been made through December 23. As it is fading rapidly, few if any additional observations are expected during this apparition.

The orbit of 1981 VA has been computed from a seven week arc of observations. The elements are semimajor axis 2.459 AU, eccentricity 0.7439, inclination 22.02°, node 246.01°, argument of perihelion 59.41°, and perihelion time 1981 September 2.47. Consequently the orbital period is 3.86 years, the perihelion distance 0.630 AU, and the aphelion distance 4.289 AU. The aphelion is at the upper limit known for terrestrial planet crossers, others being 6344 P-L at 4.21 AU and 1979 VA at 4.29 AU. An integration of the asteroid's secular perturbations over the next 5000 years shows excursions in eccentricity between 0.54 and 0.76 and excursions in inclination (to the invariable plane) between 19° and 43°. The object's perihelion distance varies between 0.60 and 1.12 AU, so that part of its life is spent as an Amor, and the aphelion distance varies between 3.80 and 4.32 AU. The radius at the intersection of the nodes with the invariable plane shows a range of 0.78 to 3.80 AU, such that the large aphelion values only occur when the aphelion is far out of the plane. Thus, the presently large aphelion distance does not imply uncommonly close approaches to Jupiter.

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